LAFCO of Napa County

Local Agency Formation Commission

1700 Second St, Suite 268
Napa, CA 94559
(707) 259-8645
FAX (707) 251-1053
http://napa.lafco.ca.gov

AGENDA ITEM NO. 9b

October 9, 2003

TO: Local Agency Formation Commission

FROM: Keene Simonds, Analyst

SUBJECT: Comprehensive Water Service Study: *Draft Determinations*

At its April 10, 2003 meeting, the Commission received a presentation by staff providing an overview of the first phase of the *Comprehensive Water Service Study*. Following this presentation, the study was released for public review and a public workshop was conducted by the Commission at its June 12, 2003 meeting. At the conclusion of the public workshop, the Commission directed staff to proceed with the next phase of the study: the development of draft determinations. Draft determinations for the Cities of American Canyon, Calistoga, Town of Yountville, and Napa Sanitation District were presented to the Commission at its August 14, 2003 meeting.

In a continuation of this process, staff has prepared draft determinations with respect to the City of Napa and the Napa County Flood Control and Water Conservation District. These draft determinations are included with updated study sections for each agency and are presented to the Commission for its consideration pursuant to Government Code §56430. Staff is presenting these draft determinations to the Commission for a first-reading. These draft determinations will then be circulated for comment from affected agencies and interested parties. Final determinations will be presented for adoption at the Commission's December 11, 2003 meeting.

Draft determinations for the remaining agencies included in the *Comprehensive Water Service Study* will be presented to the Commission at future meetings.

CITY OF NAPA

OVERVIEW

The Napa River developed as a bustling trade route in the latter part of the 19th Century. The advancement of trade along the Napa River was prompted in 1848 when a local entrepreneur, Nathan Coombs, planned southern Napa County's first community development called "Napa City." Over the next three decades, Napa City's population surged as its wharf near Third Street became the focal point of commerce in Napa Valley. Following the success of the Napa River as a trade route, Napa City's population expanded from 150 in 1850 to 3,500 by 1880. In 1883, to meet the needs of this growing community, Napa City's first potable water system was developed and operated by the Municipal Water Works Company. This initial system consisted of captured water from the Napa River, which was cleansed through a sand-filter and distributed through wooden and cast iron pipelines.

Following several years of growth, the community incorporated as the City of Napa in 1914. The City began offering water service in 1923 after purchasing the Municipal Water Works Company. This purchase coincided with the construction of Milliken Dam, allowing the City to begin diverting and storing water from Milliken Creek, a tributary of the Napa River. The construction of Milliken Dam and the subsequent creation of Milliken Reservoir, served as the City's single water source for the next 25 years. By the 1940s, however, subdivision development in Napa proved taxing to the City's water supply. In 1946, to assuage demands on Milliken Reservoir, the City completed construction on Conn Dam. The construction of Conn Dam allowed the City to begin diverting and storing water from Conn Creek, an up-valley tributary of the Napa River. The result was the creation of a reservoir, Lake Hennessey, which became the City's primary water source. To access water drawn from Lake Hennessey, the City built the Conn Transmission Line. Approximately 20 miles long, Conn Line connects to the City's distribution system in north Napa through two inter-ties. The 36-inch line is located along easements and right-of-ways paralleling State Highways 128 and 29; several affected properties that overlay the Conn Line receive water service through outside user agreements with the City.

Twenty years after the construction of Conn Dam, Napa reached an agreement with the Napa County Flood Control and Water Conservation District (NCFCWCD) for an annual entitlement of water drawn from the State Water Project (SWP). The 1966 agreement provided Napa with a gradual increase in annual entitlements, with a maximum annual entitlement of 12,500 acre-feet by 1990. The agreement was amended in 1982 as part of a statewide program by the California Department of Water Resources to encourage SWP contractors to implement water conservation programs. The amended agreement reduced the City's short-term annual entitlement, while increasing its overall annual entitlement to 18,800 acre-feet by 2021. The amended agreement requires the City to have a water conservation plan with the specific goal of conserving 1,100 acre-feet of its annual SWP water entitlement by 2010. The City's SWP entitlement was amended again in 2000

following a water transfer agreement between NCFCWCD and Kern County Water Agency (KCWA). Negotiated on behalf of the County's five cities, the water transfer agreement specified the terms and conditions for NCFCWCD to permanently purchase 4,025 acre-feet of annual SWP entitlement from KCWA. Napa's share of the Kern County transfer is 1,000 acre-feet: providing the City with a maximum annual SWP entitlement of 19,800 acre-feet by 2021.

In 1968, to treat and deliver its SWP entitlement, Napa constructed its first water treatment plant: the Jameson Canyon Water Treatment Plant (WTP). Located next to the Napa Turnout Reservoir in Jameson Canyon, the Jameson Canyon WTP provides conventional treatment of water drawn from the SWP. Water treated at the Jameson Canyon WTP is conveyed to the City through the Jameson Transmission Line, which is situated along easements and right-of-ways parallel to State Highways 12 and 29. The line splits near the intersection of State Highways 29 and 221 before diverging into different ends of the City's distribution system.

Napa's water supply proved sufficient for the next 20 years, primarily due to a change in the City's growth patterns. In 1969, the City adopted its first general plan. The general plan envisioned the City becoming an urbanized center consisting of 150,000 residents by 1990. However, by the early 1970s, public support for slower growth materialized. In 1973, residents responded in favor to an advisory ballot issued by Napa's City Council limiting the City's build-out size to 75,000. In 1975, the City adopted a new general plan that projected a population of 75,000 by 2000.

By the end of the 1980s, a prolonged statewide drought taxed local water resources and limited deliveries generated from the SWP. To meet system demands between 1989-1991, Napa purchased approximately 1,700 acre-feet of raw water from Yuba County. The purchase of Yuba County water coincided with the initiation of voluntary and mandatory conservation programs to reduce system demand. The conservation programs proved successful; annual peak water demand in the City prior to the conservation programs was 14,400 acre-feet as compared to an annual peak demand of 9,800 acre-feet in 1992. A lasting remnant of the City's conservation efforts during this time is the City's toilet retrofit program. Implemented in 1991, the program enables City customers to replace standard (7-gallon) and low-flush (3.5-gallon) toilets with ultra low-flush toilets (1.6-gallon) free of charge. In addition, the City requires that all new construction install ultra low-flush toilets.

In 1997, to improve water supply reliability, Napa issued its first comprehensive water master plan. The plan was conducted by an outside consultant and included a detailed evaluation of the City's water system. The plan recommended approximately 60 capital improvement projects to address current and future system demands over the next 25 years. Estimated cost for the 60 improvement projects: $30.2 million. Major projects included adding 10 million gallons of treated water storage capacity (to meet current storage requirements) and increasing treatment capacity at Jameson Canyon WTP (to meet scheduled increases in SWP entitlements). Notably, the plan concluded that in drought years, the City faced a short-term annual water deficit of approximately 4,200

acre-feet (based on the assumption of a 50% reduction in SWP entitlement).[1] The plan provided an analysis of potential supply alternatives, including enhancing local water resources, conjunctive use programs, increasing imported water supplies, and wastewater reclamation projects. Of special interest, the two conjunctive use programs analyzed in the plan proposed supplying groundwater users with surface flows generated from Milliken Creek or Conn Creek during above-normal and normal water years. The Milliken Creek alternative suggested supplying the two golf courses at the Silverado County Club with surface flows from Milliken Creek. The affected groundwater basin could then be recharged and available to the City during dry periods. Similarly, the Conn Creek alternative proposed supplying agricultural users in the mid-Napa Valley with water from Conn Creek or the Conn Transmission Line. The plan noted that implementation of the aforesaid conjunctive use projects would require a groundwater management plan developed in cooperation with the County. Based on cost and feasibility of implementing supply alternatives examined, the plan recommended the City pursue a water banking agreement with another SWP contractor or negotiate an acceleration of its SWP entitlement to mitigate water deficits during drought years.

Beginning in the late 1990s, Napa undertook a number of projects to improve its potable water system. In 1998, the City reached a 20-year agreement with the Napa Sanitation District (NSD) allowing NSD to provide reclaimed water service within a portion of its water service area. The agreement defines NSD's reuse area as lands east of the Napa River, south of Imola Avenue, west of State Highway 221, and north of the City of American Canyon. In addition, the agreement allows NSD to deliver reclaimed water to the Napa State Hospital, Stanley Ranch, and the South Napa Market Place. The agreement has two primary objectives: alleviate system demands on the City's potable water system and provide NSD with suitable alternatives for the storage of treated wastewater when discharge to the Napa River is prohibited.

In 1999, Napa increased its available water supply by negotiating an accelerated entitlement for its SWP supply, increasing its available entitlement from 7,400 acre-feet to 11,350 acre-feet. One year later, the City completed construction on the Lakeview Reservoir in east Napa. The Lakeview Reservoir is a buried, five million gallon reservoir that provides pressure and recharge to the City's downtown area during fluctuations in system demand. The Lakeview Reservoir replaced the Eastside Reservoir, a 30 million gallon open reservoir that was taken off-line in 1993.[2] The Eastside Reservoir served as the City's storage and treatment facility (chlorinated gas chlorinators) for water drawn from Lake Hennessey. In 1981, the Hennessey Water Treatment Plant was constructed downstream from Conn Dam and Eastside Reservoir received fully treated water from the conventional treatment facility. Until the time it was taken off-line, the Eastside Reservoir provided pressure and recharge to the City's downtown area.

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1 The plan concluded that Napa's water supply deficit would be eliminated without augmentation by 2012 due to the City's scheduled increases in SWP entitlement.

2 California Department of Health Services now requires that treated water storage facilities be covered.

In 2002, Napa completed construction of the Alston Tank No. 2, a four million gallon treated water storage tank. The Alston Tank No. 2 is in addition to the City's original A Tank (4.0 million gallons) that has served the City since 1961. Currently, the City is concluding easement negotiations to facilitate the construction of a five million gallon treated water storage tank near the Napa State Hospital. In addition, the City has recently completed the pre-design study and is preparing a Request for Proposal (RFP) for the expansion of the Jameson Canyon WTP. The City also anticipates preparing a vulnerability assessment and an emergency response plan later this year.

In addition to providing potable water service within its own service area, Napa's water system performs a key role in the supply of potable water to the City of Calistoga, Town of Yountville, and the Congress Valley Water District (CVWD). Each of these agencies maintains their own transmission lines connecting to Napa's distribution system. Both Calistoga and Yountville have agreements for Napa to treat and convey their annual SWP entitlements. Napa is reimbursed for the costs associated with the treatment and conveyance of SWP water in proportion to the amount of water delivered to each city. To facilitate delivery, Calistoga and Yountville turn their SWP entitlements over to Napa in exchange for an equivalent amount of water from the City's three commingled sources: Lake Hennessey, Milliken Reservoir, and the SWP.

Since 1951, Napa has supplied potable water to CVWD. The District was formed in 1949 under the California County Water District Law and serves a rural-residential community directly southwest of Napa. Its formation was sought by local property owners for the purpose of facilitating an agreement with the City for the delivery of potable water. Negotiations with the City were prompted following several consecutive years of water shortages in Congress Valley; during the late 1940s, groundwater supplies proved inadequate and bridled with high levels of minerals. The most recent agreement between the City and District was reached in 1987. This 30-year agreement provides the District with an annual entitlement of 100 acre-feet of potable water and restricts service to 140 connections. District customers are billed directly by the City at its inside city rate. The City maintains the distribution system serving Congress Valley and currently has 74 metered water connections. At the conclusion of the agreement in 2017, the District will voluntarily dissolve and turn over all of its assets to the City.

Finally, Napa has until recently maintained a water supply agreement with the State of California allowing the State to convey potable water from Rector Reservoir to the Napa State Hospital through an interconnection with the City's distribution system. The agreement specified the terms and conditions in which Napa agreed to reserve a maximum average of 3,000 gallons per day (subsequently amended to 1,250,000 gallons) for use by the Napa State Hospital and the Veterans Home in Yountville. However, the State was forced to take the Rector Water Treatment Plant off-line in 1981 due to water quality concerns. As a result, the State discontinued using the City's distribution system to serve Napa State Hospital. Water service to Napa State Hospital is now provided directly by the City. The Rector Water Treatment Plan was brought back on-line in 1986 and now serves the Town of Yountville and the Veterans Home. The interconnection is currently used by the Veterans Home to draw water from the City's distribution system

on a need basis. Since December 1, 2000, the City has supplied water to Napa State Hospital and the Veterans Home at the outside city limit water rate.

GOVERNANCE

Napa was incorporated in 1914 as a charter-law city and is governed by a four-member city council and directly elected mayor. The mayor and four city councilmembers serve staggered four-year terms and are elected by general vote. A city manager is appointed to oversee and implement policies on behalf of Napa's City Council. The city manager is responsible for overseeing the City's 12 departments: city clerk, civil service commission, community resources, finance, fire, housing authority, parks and recreation, personnel, planning, police, public works, and redevelopment. In 1998, Napa's City Council adopted an update to the 1982 General Plan outlining land use and development policies for the City through 2020. Napa's City Council meetings are conducted on the first and third Tuesday of each month at the City's Council Chambers. Meetings are open to the public.

OPERATIONS

Napa's water system is maintained and operated by the City's Public Works Department, Water Division. A general manager is appointed by the public works director to oversee and manage the water division's three sections: engineering and administration, treatment and operations, and distribution system maintenance. Designated staff is on call 24 hours a day, 7 days a week to respond to reported emergencies. As of February 2003, the water division consisted of 46 full-time employees.

ADOPTED BOUNDARIES

Napa's incorporated boundary is comprised of 15 non-contiguous areas consisting of approximately 11,786 acres. Napa's adopted sphere of influence encompasses the majority of the City's incorporated boundary with two notable exceptions: Alston Park and Stanly Ranch. The City's water service area extends outside its incorporated boundary to include customers north of the City along State Highway 29 towards Rutherford, east along Monticello Road towards the Silverado Estates Community, and south along State Highway 29 towards State Highway 12. Land use designations for Napa are defined in the City's General Plan.

Napa – Adopted Boundaries	
Incorporated Boundary:	11,786 acres *****
Sphere of Influence Boundary:	11,085 acres *****

* Figures are approximations calculated using information generated by County of Napa's geographic information system.

WATER SUPPLY

Napa's water supply is drawn from three sources: Lake Hennessey, Milliken Reservoir, and the SWP. Water provided by Lake Hennessy is supplied by Conn Creek, a tributary of the Napa River. Napa's water rights to Lake Hennessey are secured through a license with the State Resources Control Board, Division of Water Rights. This license authorizes the City to divert and store up to 30,500 acre-feet of water annually from Conn Creek for beneficial use. Lake Hennessey was formed following the construction of the Conn Dam in 1946 and has an approximate storage capacity of 31,000 acre-feet. The City's *Water System Optimization and Master Plan (1997)* estimated that Lake Hennessey produced a firm yield of approximately 5,000 acre-feet of water per year.[3] Lake Hennessey is typically set as the City's lead water source between May and September.

Napa's water rights to Milliken Reservoir are also secured through a license with the State Water Resources Control Board, Division of Water Rights. This license authorizes the City to divert and store up to 2,350 acre-feet of water annually from Milliken Creek – a tributary of the Napa River – for beneficial use. Milliken Reservoir was formed following the construction of the Milliken Dam in 1923 and has an approximate storage capacity of 1,980 acre-feet. The City's *Water System Optimization and Master Plan (1997)* estimated that Milliken Reservoir produced a firm yield of approximately 400 acre-feet of water per year. Milliken Reservoir is typically set as a secondary water source between March and October when its turbidity levels can be effectively treated at the Milliken Water Treatment Plant.

The portion of Napa's water supply drawn from the SWP is secured through a 1966 agreement with NCFCWCD. SWP water is generated from the Sacramento-San Joaquin Delta near Barker Slough and is delivered to the Napa Turnout Reservoir in Jameson Canyon through the North Bay Aqueduct. The original agreement provided the City with an annual entitlement of SWP water through 2035, with a maximum annual entitlement of 12,500 acre-feet by 1990 (made available in gradual increments). The agreement was amended in 1982 as part of a statewide program by the California Department of Water Resources to encourage SWP contractors to implement water conservation programs. The amended agreement reduced the City's short-term annual entitlement, while increasing its maximum annual entitlement to 18,800 acre-feet by 2021.[4] The City's SWP entitlement was modified again in 2000 following a water transfer agreement between NCFCWCD and Kern County Water Agency (KCWA). Negotiated on behalf of the five cities in Napa County, the agreement specified terms and conditions for NCFCWCD to permanently purchase 4,025 acre-feet of annual SWP entitlement from KCWA. Napa's share of the Kern County water transfer is 1,000 acre-feet. As a result of these amendments, the City's cumulative maximum annual SWP entitlement is 19,800

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[3] Napa's *Water System Optimization and Master Plan (1997)* defined "firm yield" as the supply available under drought conditions.

[4] In 1999, Napa negotiated an acceleration of its entitlement schedule increasing the available SWP entitlement in 1999 from 7,400 acre-feet to 11,350 acre-feet.

acre-feet by 2021. Water drawn from the SWP is typically used as the City's lead water source between October and April.

Napa – Available Water Supply (acre-feet)			
Year	**Lake Hennessey***	**Milliken Reservoir***	**State Water Project****
2003	31,000	1,980	13,350
2004	31,000	1,980	13,600
2005	31,000	1,980	13,850
2006	31,000	1,980	14,100
2007	31,000	1,980	14,350
2008	31,000	1,980	14,600

* Napa's *Water System Optimization and Master Plan (1997)* estimated Lake Hennessey and Milliken Reservoir's annual firm yields at 5,000 acre-feet and 400 acre-feet respectively.

** Napa's SWP entitlements are gradually increased each year through 2021 at which time the City shall reach its maximum annual entitlement of 19,800 acre-feet. Entitlements continue thereafter until 2035.

WATER DEMAND

In 2002, Napa delivered approximately 5.7 billion gallons (17,613 acre-feet) of potable water, resulting in an approximate daily average of 15,726,238 gallons. The City's maximum day water demand was approximately 30.7 million gallons. The City currently provides water service to approximately 24,293 connections. Of this amount, 2,187 connections are located outside of the City, including inter-ties with the City of Calistoga, Town of Yountville, and the Congress Valley Water District.[5]

Napa – 2002 Water Demand	
Annual Water Demand:	5,740,076,700 *
Average Daily Water Demand:	15,726,238 gallons
Maximum Day Water Demand:	30.7 million gallons **
Water Connections:	24,293
Population Served:	80,167 ***

[5] Outside water service connections are restricted and subject to an application process codified in the City's "Resolution No. 7." Resolution No. 7 limits extension of water service to outside residential properties of legal record as of December 31, 1982 that are contiguous to an existing public right-of-way that includes an existing water line. In addition, outside residential properties that are located within the City's Rural Urban Limit must annex to the City unless annexation is not legally permissible or the Council waives the requirement. Exemptions require approval by four-fifths of the City Council.

* Includes potable water deliveries to the City of Calistoga, Town of Yountville, and the Congress Valley Water District. In 2002, Napa delivered approximately 560 acre-feet to Calistoga, 282 acre-feet to Yountville, and 50 acre-feet to Congress Valley Water District. In addition, Napa delivered approximately 636 acre-feet to the City of American Canyon. Similar to its agreements with Calistoga and Yountville, Napa "treats and wheels" a portion of American Canyon's SWP entitlement when the North Bay Aqueduct is off-line or when American Canyon's treatment facility is shut down for repair. This arrangement is facilitated through a recently expired emergency water supply agreement. Both agencies are currently negotiating a renewal to this agreement.

** Title 22 of the California Code of Regulations requires that sufficient water be available from the water sources and distribution reservoirs to adequately and dependably meet the requirements of all users under maximum demand conditions.

******* Calculated in accordance with Title 22 of the California Code of Regulations, Government Code §64412.2

Projected water demands for Napa were identified in the City's *Water System Optimization and Master Plan (1997).* The plan identified existing and projected water demands for Napa's water service area in 2010 and 2020 under two hydrological conditions: normal and restricted. Demands were determined by applying historical unit water demand factors for six consolidated land use classifications with expected land use development according to the City's General Plan. Consolidated land use classifications identified in the plan included single-family residential, multi-family residential, commercial/industrial, elementary schools, high schools and Napa Community College, and parks and sports complexes.

Napa – Projected Water Demands (acre-feet) *		
Year	**Normal Conditions**	**Restricted Conditions****
2010	15,063	12,050.40
2020	16,566	13,252.80

* Napa's projected water demand does not include demands for the City of Calistoga or the Town of Yountville. Projected water demands also assume an 8% reduction in demand due to the implementation of the City's long-term water conservation program.

** Restricted demand based on 20% reduction in normal year demand due to conservation measures enacted during drought years.

WATER TREATMENT FACILITIES

Napa provides treatment of raw water at three water treatment plants (WTP): Hennessey, Milliken, and Jameson Canyon. The Hennessey WTP was constructed in 1981 and receives raw water from Lake Hennessey through an intake pump system. The treatment process begins as raw water is injected with potassium permanganate (disinfectant), alum and polymer (coagulants) before entering a flash mixer. Solids are removed as raw water passes through flocculation and sedimentation basins. Settled water is filtered and injected with chlorine (disinfectant) and caustic soda (controls acidity) before flowing into a 5.0 million gallon clearwell tank. The clearwell tank completes the disinfection process by facilitating the necessary contact time between the chlorine and treated water. Finished water remains in the clearwell tank until storage levels within the City's distribution system require recharge. The Hennessey WTP has a treatment capacity of approximately 13,888 gallons per minute, resulting in a daily treatment capacity of 20 million gallons.

Raw water drawn from Milliken Reservoir is treated at the Milliken WTP. The Milliken WTP was constructed in 1976 and receives raw water through a transmission line that captures released water from Milliken Creek. The treatment process begins as chlorine, alum and polymer are injected as raw water is detained in a contact/reaction tank. Solids are removed as the settled water is filtered and pumped to a 2.0 million gallon clearwell tank. The clearwell tank completes the disinfection process and stores finished water until storage levels in the distribution system require recharge. The Milliken WTP has a treatment capacity of approximately 2,777 gallons per minute, resulting in a daily treatment capacity of 4.0 million gallons.

The Jameson Canyon WTP provides treatment for raw water drawn from the SWP. The Jameson Canyon WTP was constructed in 1968 and receives SWP water through a transmission line that connects to the Napa Turnout Reservoir (SWP storage facility). SWP water is generated from the Sacramento-San Joaquin Delta near Barker Slough and is conveyed to the Napa Turnout Reservoir by the North Bay Aqueduct. Raw water stored inside the Napa Turnout Reservoir is pretreated with potassium permanganate. The treatment process at Jameson Canyon WTP begins as raw water is injected with alum, polymer, and chlorine before entering a flash mixer. Solids are then removed as raw water passes through flocculation and sedimentation basins. Settled water is filtered and injected with chlorine and caustic soda before entering a 5.0 million gallon storage clearwell tank. The clearwell tank completes the disinfection process and stores finished water until storage levels in the distribution system require recharge. The Jameson Canyon WTP has a treatment capacity of approximately 8,333 gallons per minute, resulting in a daily treatment capacity of 12 million gallons.[6]

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[6] Napa is currently in the pre-design process of expanding the treatment capacity at the Jameson Canyon WTP to 29 million gallons a day. The project is scheduled to begin in 2005.

Hennessey Water Treatment Plant	
Water Source:	Lake Hennessey
Treatment Capacity:	13,888 gallons per minute; or 20 million gallons per day
Clearwell Storage Capacity:	5.0 million gallons

Milliken Water Treatment Plant	
Water Source:	Milliken Reservoir
Treatment Capacity:	2,777 gallons per minute; or 4.0 million gallons per day
Clearwell Storage Capacity:	2.0 million gallons

Jameson Canyon Water Treatment Plant	
Water Source:	State Water Project
Treatment Capacity:	8,333 gallons per minute; or 12 million gallons per day
Clearwell Storage Capacity:	5.0 million gallons

DISTRIBUTION SYSTEM AND STORAGE FACILITIES

Napa's distribution system receives and distributes potable water generated from its three water treatment plants: Hennessey, Milliken, and Jameson Canyon. The distribution system overlays five pressure zones and is served (recharge and system pressure) by three clearwell tanks and 11 storage tanks. "Zone 3" serves as the City's primary pressure zone and underlays the northwest, northeast, and south portion of its water service area. All three transmission lines (Conn, Milliken, and Jameson) gravity feed directly into Zone 3. "Zone 1" and "Zone 2" are located on lower elevations and receive water that is released from Zone 3. Zone 1 underlays the downtown area while Zone 2 underlays the remaining portion of central Napa. Collectively, these three pressure zones constitute the majority of the City's distribution system and include 11 pressure reducing stations that regulate pressure between interchanges.

"Zone 4" and "Zone 5" consist of eight independent subzones serving residential customers in Napa's outlying water service areas. Zone 4 underlays Browns Valley, Alta Heights, and the Hillcrest area and is served by booster pumps from Zone 3 and the Milliken Clearwell Tank. Zone 5 underlays a small portion of Alta Heights and the Silverado Highlands and is served by booster pumps from Zone 3 and the Milliken Clearwell Tank. In all, there are nine booster pump stations that lift water to Zones 4 and 5.

Napa's distribution system operates on a supply and demand basis and responds to storage levels within Zone 3. When storage levels within Zone 3 require recharge, potable water is released from the designated clearwell tank in accordance to the City's water supply schedule. The City's primary water supply alternates between Lake Hennessey and the SWP; Milliken Reservoir is used as a secondary water source between

March and October. As a result, the distribution system is primarily dependent on two transmission lines: the Conn Transmission Line and the Jameson Transmission Line.

The Conn Transmission Line was constructed in 1948 and delivers potable water to Napa from the clearwell tank at the Hennessey WTP. The 36-inch line is approximately 20 miles long and runs parallel to Conn Creek, State Highway 128, and State Highway 29. The Conn Line travels along easements and right-of-ways before connecting to the Jameson Line in northwest Napa. The two transmission lines connect near the intersection of West Pueblo Avenue and Solano Avenue. A second connection is made as the Conn Line continues east from its original connection point to the Lakeside Reservoir in northeast Napa. The second connection point is near the intersection of East Avenue and Evans Avenue.

The Jameson Transmission Line was constructed in 1967 and delivers potable water to Napa from the clearwell tank at the Jameson Canyon WTP. The Jameson Line is comprised of a 42-inch line that runs parallel from Jameson WTP to Jameson Canyon Road and State Highway 29. The line splits into 36-inch and 24-inch lines near the intersection of State Highways 29 and 221. The 36-inch line continues northwest along State Highway 29 and underneath the Napa River before connecting to the Conn Line near the intersection of West Pueblo Avenue and Solano Avenue. The 24-inch line continues north from the split along State Highway 221 before connecting to the Conn Line near the intersection of East Avenue and Evans Avenue.

A third transmission line, the Milliken Transmission Line, delivers potable water from the clearwell tank at the Milliken WTP to Napa. The 16-inch and 14-inch line is approximately three miles long and connects to the City's distribution system near the intersection of Silverado Trail and Monticello Road. The Milliken Line also provides water service to the residential area near the Silverado County Club as well as the Hillcrest area.

Napa – Distribution Storage Capacity	
Storage Tank A (Alston):	4.0 million gallons
Storage Tank A No. 2 (Alston):	4.0 million gallons
Storage Tank B:	1.0 million gallons
Storage Tank C:	2.0 million gallons
Alta Heights Tank 1:	45,000 gallons
Alta Heights Tank 2:	5,000 gallons *
Falcon Ridge Tank:	25,000 gallons
Hagen Oaks Tank:	25,000 gallons
Holly Court Tank:	600 gallons *
Lakeview Reservoir:	5.0 million gallons
Silverado Tank:	10,000 gallons
TOTAL:	**16,110,600 gallons ****

* Pressure tanks

** Figure does not include storage capacity within Napa's three clearwell tanks (12 million gallons) or the Alta Heights Fire Tank (45,000 gallons)

RATE SCHEDULE

Napa's water customers are charged a bimonthly usage fee for water service. The usage fee is fixed and divided between inside and outside city customers. The fee is based on the amount of water delivered and is measured in units of 1,000 gallons. A lift elevation surcharge is applied to some customers located within the City's two highest pressure zones: Zone 4 and Zone 5. This charge is intended to recover costs associated with the operation of booster pumps needed to lift treated water to the above-noted pressure zones. Connection fees are divided between three customer classes: single-family residential, multi-family residential, and non-residential (commercial, industrial, and irrigation). Residential connection fees are based on meter size and the number of living units, while non-residential connection fees are based solely on meter size.[7]

Napa – Rate Schedule	
Water Usage Fee Inside City: Outside City:	 $3.23 per 1,000 gallons $4.32 per 1,000 gallons
Lift Elevation Fee:	$0.15 per 1,000 gallons
Connection Fee Single-Family Residential: Multi-Family Residential: Non-Residential: (commercial/industrial/irrigation)	 3/4-inch meter size: $2,117 1-inch meter size: $2,117 1.5-inch meter size: $7,049 2-inch meter size: $11,283 Detached (living unit): $2,117 Attached (additional unit): $1,588 3/4-inch meter size: $2,117 1-inch meter size: $3,535 1.5-inch meter size: $7,049 2-inch meter size: $11,283 3-inch meter size: $22,587 4-inch meter size: $35,288 6-inch meter size: $70,556 8-inch meter size: $112,893 12-inch meter size: calculated

[7] Connection fees for fire service are calculated independently from the formula used to determine residential and non-residential connection fees.

FINANCIAL

Napa's Water Enterprise Fund has an approved operating budget for 2002-2003 of $14,929,007. Primary expenses include maintenance and operation costs, employee payroll, and capital improvements. The City's anticipated revenue for 2002-2003 is $14,894,000. Revenue sources include water sales, connection fees, and interest on reserve funds. As of February 2003, the City's Water Enterprise Fund's cash reserve balance was $5,825,000.

WRITTEN DETERMINATIONS

In anticipation of reviewing and updating Napa's sphere of influence, and based on the above-mentioned information, the following written determinations are intended to fulfill the requirements of Government Code §56430. When warranted, some determinations include supplemental information listed in italics to provide context to the underlying service factor. A review of Napa's sphere of influence will be included as part of a future study.

Infrastructure Needs or Deficiencies:

1. Through its local and imported water supply, the City of Napa has an adequate supply of water to meet existing and projected water demands under normal conditions within the timeframe of this study.

2. The City of Napa should continue to pursue opportunities to increase and enhance its available water supply and continue to educate its constituents with respect to water conservation opportunities. These actions will help to ensure an adequate water supply during periods of below normal and dry year conditions.

3. Through its contractual agreements, the City of Napa's water system performs a key role in the supply of potable water to the City of Calistoga, Town of Yountville, and the Congress Valley Water District. Napa should continue to address the system needs of these agencies in their water supply planning efforts. This includes evaluating and implementing mutually beneficial system improvements to maximize the timely availability of water to each affected agency, while minimizing the demand on Napa's stored reserves.

4. As a subcontractor of Napa County Flood Control and Water Conservation District, the City of Napa receives an annual entitlement of water drawn from the State Water Project. To account for the realities of water entitlements, Napa should continue to objectively differentiate between entitlements and actual deliveries in their water supply analysis. This is especially important to ensure an adequate supply of water during extended drought periods when deliveries are restricted.

5. In 2003, the Department of Water Resources issued the *State Water Project Delivery Reliability Report*. The report provides an assessment of State Water Project deliveries using historical precipitation rates along with projected land and water use demands through 2021. Notably, this report includes delivery estimates during drought periods. This report is a valuable tool for all SWP contractors and should be incorporated into Napa's water supply planning efforts.

6. The City of Napa has made reasonable efforts to secure additional water supplies to meet existing and projected water demands within its service area. This demonstrates a continued effort by Napa to address system needs and deficiencies in a timely manner.

   Examples include Napa's 1989-1991 water supply agreement with Yuba County and its participation in Napa County Flood Control and Water Conservation District's 2000 water transfer agreement with Kern County Water Agency. In addition, Napa has continually benefited from augmenting its imported water supply with carryover and interruptible water supplies generated by the California Department of Water Resources.

7. The City of Napa requires improvements to its treated water storage facilities to meet future maximum day water demands and ensure adequate reserves during an emergency or interruption in service.

   Napa's maximum day water demand in 2002 was 30.7 million gallons, while its total treated water storage capacity is approximately 28.1 million gallons (including storage capacities within its three clearwell storage tanks). Napa is currently in easement negotiations to facilitate the construction of a 5.0 million gallon treated water storage tank near the Napa State Hospital. Once completed, this project will increase Napa's available treated water storage capacity to approximately 33.1 million gallons, enabling Napa to meet its projected required storage capacity of 33.1 million gallons in 2010.

8. The City of Napa has an agreement with the Napa Sanitation District permitting the District to solicit and provide reclaimed water service within a portion of its water service area. The extension of reclaimed water service within Napa's "reuse area" is an important component to its water conservation efforts and offers the promise of alleviating future potable water demands.

   Existing potable water customers within Napa's reuse area includes the Napa State Hospital, Kennedy Park, Napa Municipal Golf Course, Napa Valley College, and the South Napa Market Place. In 2002, Napa delivered approximately 843.1 acre-feet of potable water to these customers.

9. Reclamation is a beneficial and efficient use of existing water resources and will strengthen the City of Napa's water conservation efforts.

10. Evaluation of Napa Sanitation District's reclaimed water program within the City of Napa's water service area and its actual impact on the City's potable water demands should be evaluated in future studies.

Growth and Population Projections:

1. The City of Napa evaluates its water service capacities using reasonable demand projections detailed in its *Water System Optimization and Master Plan (1997).*

2. The calculation formula codified in Title 22 of the California Code of Regulations, Government Code §64412.2, is an appropriate method in estimating the total population served by the City of Napa's water service system. The population served by Napa's water system based on this calculation method is 80,167.

Financing Constraints and Opportunities:

1. The City of Napa's water service operations are primarily financed through the collection of fixed water usage fees; service fees are not collected. Due to the variance associated with this revenue source, Napa's water service operations could experience a significant loss in revenue during a drought when water sales are reduced as a result of conservation measures.

   Napa maintains a "Revenue Stabilization Reserve Fund" as part of its cash reserves for its water enterprise fund. This reserve fund is designed to help cover operating costs during a drought when the City experiences a loss in water sale revenues.

2. The City of Napa has been successful in supplementing its capital reserves with outside financing to cover the costs of implementing needed capital improvements to its water service operations.

   In 2002, Napa received a four million dollar low-interest loan from the California Department of Water Resources to fund construction of the Alston Park No. 2 treated water storage tank. This loan was made available to Napa as part of California's Safe, Clean, Reliable Water Supply Act of 1996. Napa is currently pursuing a similar loan to finance the construction of a five million gallon treated water storage tank near the Napa State Hospital.

3. The City of Napa has an agreement with the Napa Sanitation District permitting the District to solicit and provide reclaimed water service within a portion of its water service area. As part of this agreement, Napa is reimbursed for the loss of potable water sales revenue attributed to a customer's conversion to reclaimed water service; reimbursement continues until Napa regains its previous revenue level (based on gallons) prior to conversion. This arrangement should provide

Napa with added revenue over the short-term, while reducing its operation cost relating to the treatment and delivery of potable water.

4. As Napa Sanitation District begins to extend reclaimed water service within the City of Napa's water service area, future studies should further examine the long-term financial impact this arrangement has on Napa's water service operations.

Cost Avoidance Opportunities:

1. The City of Napa is a member of Napa County Flood Control and Water Conservation District's technical advisory committee, known as "Wartac." This group provides NCFCWCD with input among the five cities and County as it relates to current and future water issues affecting Napa County. This advisory group provides Napa the opportunity to share costs with other participating agencies on projects of mutual interest and facilitates the exchange of service information.

2. The City of Napa is a funding participant in Napa County Flood Control and Water Conservation District's '2050 Study." This study's objective is to identify current and projected water demands within each participating agency's service area as well as document agricultural demands in unincorporated areas served by groundwater. This study will also examine the feasibility of pursuing cooperative water supply projects aimed at meeting countywide demands through 2050. Napa will benefit from the study and should continually explore collaborative opportunities aimed at identifying new and improved water supplies.

Opportunities for Rate Restructuring:

1. The City of Napa's water service rates were last increased in 1999 and are competitive with the rates offered by the other four cities in Napa County.

2. The City of Napa should consider adopting a service fee to supplement its bimonthly usage fee. A service fee would lessen the financial impact resulting from lost revenue during a drought when water sales are reduced as a result of conservation measures.

   Napa recently initiated work on a financing plan to determine revenue requirements for its water service operations, including funding approved capital improvement projects. As part of this plan, Napa will be conducting a review of its water rate schedule. This review could result in the recommendation for an increase to its current water rate schedule.

Opportunities for Shared Facilities:

1. As a subcontractor to Napa County Flood Control and Water Conservation District, the City of Napa is responsible for assuming its proportional costs for the delivery of water drawn from the State Water Project. Subcontractors are also responsible for paying a transportation charge that covers the cost associated with the infrastructure and facilities needed to capture and convey water to Napa County. These shared facilities include the North Bay Aqueduct and the Napa Turnout Reservoir. Costs relating to future upgrades and improvements to this conveyance system will be shared among each subcontractor as well as the Solano County Water Agency and its subcontractors.

   Improvements to the North Bay Aqueduct are needed to increase its available capacity to equal the amount of entitlements contracted by the Napa County Flood Control and Water Conservation District (NCFCWD). NCFCWCD is currently working with the Solano County Water Agency to implement improvements to the North Bay Aqueduct to meet both agencies contracted entitlement amount. A key factor to this planned improvement is the completion of the original design of the North Bay Aqueduct and to satisfy the increase in State Water Project entitlements generated from NCFCWCD's agreement with the Kern County Water Agency.

2. The City of Napa shares costs with the City of Calistoga and the Town of Yountville relating to its water treatment and delivery facilities for treating and conveying each agency's allotment of water entitlements drawn from the State Water Project. Napa's relationship with each of these agencies provide the mechanism for the City to share costs relating to future system improvements for its water system, while eliminating the need for Calistoga and Yountville to invest in duplicate conveyance infrastructure.

3. The City of Napa and the Napa Sanitation District share resources relating to each agency's toilet retrofit program. Both agencies' programs are managed by a shared employee and offer incentives for constituents to replace their standard and low-flush toilets with ultra-flush toilets. This collaborative effort lessens the demand on Napa's potable water supply, while reducing the amount of wastewater needed to be collected and treated by Napa Sanitation District. This relationship facilitates cost efficiencies between both agencies and serves to encourage the efficient use of existing water resources within each agency's respective service area.

Government Structure Options:

1. The City of Napa is the only public agency currently providing potable water service within its jurisdictional boundary. There are two other public agencies empowered to provide potable water service whose jurisdictions overlap that of Napa: the Napa County Flood Control and Water Conservation District and Napa

County Resource Conservation District. Both of these agencies have elected not to offer water service, and have expressed no intentions of doing so in the foreseeable future.

2. Extension of the City of Napa's water service operations should be limited to parcels lying within its jurisdictional and sphere of influence boundary. Extension of water service by contract or agreement to parcels outside these adopted boundaries must be approved by the Commission and based on specific findings pursuant to Government Code §56133.

3. The City of Napa has elected not to exercise its right to provide reclaimed water service. Under the terms of a 1998 agreement, Napa permits the Napa Sanitation District to provide reclaimed water service within a specified portion of its water service area. A jurisdictional-wide arrangement for the provision of reclaimed water service would enhance planning between both agencies and facilitate greater opportunities for the extension of reclaimed water service for beneficial uses.

4. As part of a 1987 agreement, the City of Napa provides potable water supplies and maintains the distribution system for the Congress Valley Water District. This agreement specifies that the Congress Valley Water District voluntarily dissolve and turn over all assets to Napa in 2017. Future studies should evaluate the relationship between both agencies, including the impacts of dissolution and the benefits of alternative government structure options for the affected area.

Evaluation of Management Efficiencies:

1. Each year, the City of Napa provides a summary of past and projected revenues and expenditures stemming from its water service operations as part of its annual budget. The budget is adopted following a series of internal steps and reviews that precedes a public workshop and hearing in which members of the public are allowed to comment and offer suggestions with respect to expenditures relating to water service. In addition to enhancing the accountability of elected and appointed officials, the budget process provides a clear directive towards staff with respect to prioritizing city resources.

2. In 1997, the City of Napa prepared its first comprehensive water master plan. The plan recommended approximately 30 million dollars in capital improvement projects to address existing and future water system requirements through 2020. The capital improvement program was adopted by Napa's City Council and demonstrates a reasonable effort on behalf of management to address and update water quality and service objectives in a timely and efficient manner.

3. The City of Napa has sufficient capital reserves to finance necessary upgrades and improvements to its water system; reserves are generated from surplus revenue drawn from water sales. Applying surplus revenue from water sales is a fair and equitable approach to passing capital expenditures to ratepayers without incurring or relying on loans, special assessments, or bonded indebtedness to fund needed improvements.

Local Accountability and Governance:

1. The City of Napa City Council meetings are conducted twice a month and are open to the public. Public inquiries involving water service operations can be addressed to the Council at this time. Regularly scheduled council meetings provide an opportunity for Napa's constituents to ask questions of their elected representatives, while helping to ensure that service information is being effectively communicated to the public.

2. The City of Napa makes reasonable efforts to maintain public dialogue with its constituents regarding its water service operations. These efforts facilitate local accountability and contribute to public involvement in local governance.

   These efforts include mailing an annual newsletter providing an overview of water service operations, inserting news inserts with billing statements, special mailings for major construction projects, and posting pertinent service information, including its most recent "water quality report," on Napa's website. Customers can visit or call Napa's water billing division during regular business hours to discuss questions regarding their bimonthly water bill. Designated water division employees are also on call 24 hours a day to respond to reported emergencies.

3. The City of Napa is the largest potable water service provider in Napa County, serving approximately 80,000 customers. In addition to serving its own customers, Napa is under contract to provide potable water to three other public agencies in the County: City of Calistoga, Town of Yountville, and Congress Valley Water District. Napa should continue to diligently evaluate and implement improvements to its water service operations to meet system demands and help to ensure a safe and reliable water supply.

4. The City of Napa is currently preparing two studies aimed at evaluating its water service system with respect to vulnerability and emergency response capabilities. Collectively, these studies should enhance Napa's ability to mitigate deficiencies to its water service facilities and improve system responses during an emergency or interruption in service.

5. The City of Napa's Water Service Division actively pursues and promotes water conservation opportunities through various components of its water conservation program. This program helps to ensure the beneficial and long-term use of existing water resources within Napa's service area and is an important component in strengthening its local accountability.

   Examples include offering a toilet retrofit program, issuing water conservation materials, conducting water efficient landscaping workshops, and attending local annual events, such as Napa County Fair and the Napa County Home and Garden Show.

6. The City of Napa's administration and water service operations are maintained and managed by a responsive and professional staff. These characteristics enhance accountability and cultivate desirable working relationships with members of the public as well as other agencies.